Atty. Dkt. No. 037010-0201

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of analyzing uncertainties in a system having at least two modules, comprising:

propagating an uncertainty distribution associated with each of a set of inputs through a module to produce an uncertainty in a set of outputs of said module;

generating a probabilistically equivalent model of said module, said equivalent model producing a model of said outputs, **the equivalent model using polynomial chaos expansions**; and

providing said model of said outputs in a common data architecture for use as inputs by any other module in said system.

2. (Original) The method according to claim 1, wherein said probabilistically equivalent model is a deterministically equivalent model.

3. (Original) The method according to claim 2, wherein said deterministically equivalent model is a reduced-order model.

4. (Original) The method according to claim 1, wherein said propagating said uncertainty distribution uses a Monte Carlo method.

5. (Original) The method according to claim 1, wherein at least one of said set of outputs is incorporated into at least one of said set of inputs in a feedback loop.

6. (Currently Amended) A method of analyzing uncertainties in a system, comprising:

substituting at least one of a plurality modules of a system with a corresponding probabilistically equivalent module model, said equivalent module model adapted to propagate uncertainties in inputs of said module to outputs of said module, **the equivalent model using polynomial chaos expansions**;

providing outputs of each of said modules in a common data architecture for use as inputs by any other module, said architecture adapted to propagate uncertainties in said outputs to said inputs of said other module; and

substituting said plurality of modules with a single probabilistically equivalent system model for propagating uncertainties in system inputs to system outputs.

7. (Original) The method according to claim 6, further comprising:

providing an optimization module for optimizing an objective function, said optimization module adapted to receive said system outputs and to vary said system inputs.

8. (Original) The method according to claim 7, wherein said objective function is a weighted function of two or more output parameters.

9. (Original) The method according to claim 6, wherein said probabilistically equivalent module model is a deterministically equivalent model.

10. (Original) The method according to claim 9, wherein said deterministically equivalent model is a reduced-order model.

11. (Original) The method according to claim 6, wherein said probabilistically equivalent system model is a deterministically equivalent model.

12. (Original) The method according to claim 11, wherein said deterministically equivalent model is a reduced-order model.

13-34. (Canceled)

35. (Currently Amended) A program product **embodied on a computer-readable storage medium**, comprising machine readable program code for causing a machine to perform following method steps:

propagating an uncertainty distribution associated with each of a set of inputs through a module to produce an uncertainty in a set of outputs of said module;

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generating a probabilistically equivalent model of said module, said equivalent model. producing a model of said outputs, **the equivalent model using polynomial chaos expansions**; and

providing said model of said outputs in a common data architecture for use as inputs by any other module in said system.

36. (Original) The program product according to claim 35, wherein said probabilistically equivalent model is a deterministically equivalent model.

37. (Original) The program product according to claim 36, wherein said deterministically equivalent model is a reduced-order model.

38. (Original) The program product according to claim 35, wherein said propagating said uncertainty distribution uses a Monte Carlo method.

39. (Currently Amended) A program product **embodied on a computer-readable storage medium**, comprising machine readable program code for causing a machine to perform following method steps, comprising:

substituting at least one of a plurality modules of a system with a corresponding probabilistically equivalent module model, said equivalent module model adapted to propagate uncertainties in inputs of said module to outputs of said module, **the equivalent model using polynomial chaos expansions**;

providing outputs of each of said modules in a common data architecture for use as inputs by any other module, said architecture adapted to propagate uncertainties in said outputs to said inputs of said other module; and

substituting said plurality of modules with a single probabilistically equivalent system model for propagating uncertainties in system inputs to system outputs.

40. (Original) The program product according to claim 39, wherein said program code causes a machine to further perform the following method step, further comprising:

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providing an optimization module for optimizing an objective function, said optimization module adapted to receive said system outputs and to vary said system inputs.

41. (Original) The program product according to claim 40, wherein said objective function is a weighted function of two or more output parameters.

42. (Original) The program product according to claim 39, wherein said probabilistically equivalent module model is a deterministically equivalent model.

43. (Original) The program product according to claim 42, wherein said deterministically equivalent model is a reduced-order model.

44. (Original) The program product according to claim 39, wherein said probabilistically equivalent system model is a deterministically equivalent model.

45. (Original) The program product according to claim 44, wherein said deterministically equivalent model is a reduced-order model.